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EXAMINER	
QUASH, ANTHONY G	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 10/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/882,818	NOTTE, JOHN A.	
	Examiner	Art Unit	
	Anthony Quash	2881	

-- Th MAILING DATE of this communication app ars on the cover sh et with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20,35 and 40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20,35 and 40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 20,40 are rejected under 35 U.S.C. 102(b) as being anticipated by Nomura [689]. As per claim 20, Nomura [689] teaches a method for controlling a magnetic field strength of a magnetic lens, comprising; generating an output signal in response to a first magnetic field strength generated by the magnetic lens; generating an input signal in response to a predetermined magnetic field strength; generating a control signal in response to the output signal and the input signal; and applying a current to the magnetic lens, wherein the current is responsive to the control signal. See Nomura [689] abstract, figs. 1-3,6-7B, col. 1 lines 30-68, column 4, col. 5 lines 1-40, col. 7 lines 1-55, col. 12 lines 50-68, col. 13 lines 20-45, col. 14 lines 60-65, col. 15 lines 35-60, and col. 16 lines 40-55.

As per claim 40, Nomura [689] teaches a method for inspecting a specimen, comprising: generating a magnetic field by a magnetic lens and applying the magnetic field to a charged particle beam, wherein applying the magnetic field to the charged particle beam comprises directing the charged particle beam through the magnetic lens; and controlling a magnetic field strength of the magnetic lens, comprising: generating an output signal in response to a first magnetic field strength generated by the magnetic

lens; generating an input signal in response to a predetermined magnetic field strength; generating a control signal in response to the output signal and the input signal; and applying a current to the magnetic lens, wherein the current is responsive to the control signal. See Nomura [689] abstract, figs. 1-3,6-7B, col. 1 lines 30-68, column 4, col. 5 lines 1-40, col. 7 lines 1-55, col. 12 lines 50-68, col. 13 lines 20-45, col. 14 lines 60-65, col. 15 lines 35-60, and col. 16 lines 40-55.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-14,19,35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura [689]. As per claims 1,35, Nomura [689] teaches an apparatus configured to control a magnetic field strength of a magnetic lens (17) during use, comprising: a magnetic sensor (1-4,6-9) disposed within a magnetic field generated by the magnetic lens (17), wherein the magnetic sensor (1-4,6-9) is configured to generate an output signal during use, and wherein the output signal is responsive to a first magnetic field strength generated by the magnetic lens (17). See Nomura [689] abstract, figs. 1-3,6-7B, col. 1 lines 30-68, column 4, col. 5 lines 1-40, col. 7 lines 1-55, col. 12 lines 50-68, col. 13 lines 20-45, col. 14 lines 60-65, col. 15 lines 35-60, and col. 16 lines 40-55. However Nomura [689] does not specifically teach a control circuit

coupled to the magnetic sensor and magnetic lens. Nomura [689] does teach control means connected to the magnetic sensor (1-4,6-9) and the magnetic lens (17), wherein the control means is configured: to receive the output signal from the magnetic sensor (1-4,6-9) during use; to receive an input signal responsive to a predetermined magnetic field strength during use; to generate a control signal responsive to the output signal and the input signal during use; and to apply a current to the magnetic lens, wherein the current is responsive to the control signal. In addition, Nomura [689] teaches a magnetic lens being positioned along a path of a charged particle beam and the apparatus being coupled to the magnetic lens. See Nomura [689] abstract, figs. 1-3,6-7B, col. 4 lines 25-68, col. 5 lines 1-40, col. 7 lines 1-55, col. 12 lines 50-68, col. 13 lines 20-45, and col. 14 lines 60-65. Therefore, because the control means (CPU) of Nomura [689] and the control circuit of applicant's invention perform the same function one of ordinary skill in the art would have found it obvious to substitute the control means of Nomura for the control circuit of applicant's invention since they both perform the function of regulating the magnetic field strength.

As per claim 2, Nomura [689] teaches the magnetic lens (17) being configured to apply a magnetic field to a charged particle beam during use. See Nomura [689] abstract, figs. 1-3,6-7B, col. 4 lines 25-68, and col. 5 lines 1-40.

As per claim 3, Nomura [689] the magnetic lens is coupled to a scanning electron microscope. See Nomura [689] figs. 1-3,6-7B.

As per claim 4, Nomura [689] teaches all aspects of the claim except for the input signal comprising a voltage having a linear relationship to the predetermined magnetic

field strength of the magnetic lens. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the input signal comprise a voltage having a linear relationship to the predetermined magnetic field strength of the magnetic lens in order to reduce the time need for adjusting the magnetic field strength of the lens.

As per claim 5, Nomura [689] teaches all aspects of the claim except for the output signal comprising a voltage having a linear relationship to the first magnetic field strength of the magnetic lens. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the output signal comprising a voltage having a linear relationship to the first magnetic field strength of the magnetic lens in order to reduce the time need for adjusting the magnetic field strength of the lens.

As per claim 6, Nomura [689] teaches the control signal is responsive to a function of the output signal and the input signal. See Nomura [689] abstract, figs. 1-3,6-7B, col. 1 lines 30-68, column 4, col. 5 lines 1-40, col. 7 lines 1-55, col. 12 lines 50-68, col. 13 lines 20-45, col. 14 lines 60-65, col. 15 lines 35-60, and col. 16 lines 40-55.

As per claim 7, Nomura [689] teaches the control circuit is further configured to apply a current to at least one coil of the magnetic lens (17). See Nomura [689] col. 5 lines 1-40, col. 7 lines 45-50, and col. 12 lines 50-69.

As per claim 8, Nomura [689] teaches the applied current is effective to generate a second magnetic field strength within the magnetic lens, and wherein the second magnetic field strength is closer to the predetermined magnetic field strength than the

first magnetic field strength. See Nomura [689] column 4 and col. 5 lines 1-40.

As per claim 9, Nomura [689] teaches the applied current being effective to generate a second magnetic field strength within the magnetic lens, and wherein the second magnetic field strength is substantially the same as the predetermined magnetic field strength. See Nomura [689] lines 20-30.

As per claim 10, Nomura [689] teaches the apparatus being further configured to continuously control the magnetic field strength of the magnetic lens during use. See Nomura [689] abstract, figs. 1-3,6-7B, col. 1 lines 30-68, column 4, col. 5 lines 1-40, col. 7 lines 1-55, col. 12 lines 50-68, col. 13 lines 20-45, col. 14 lines 60-65, col. 15 lines 35-60, and col. 16 lines 40-55.

As per claim 11, Nomura [689] teaches the apparatus being further configured to intermittently control the magnetic field strength of the magnetic lens during use. See Nomura [689] abstract, figs. 1-3,6-7B, col. 1 lines 30-68, column 4, col. 5 lines 1-40, col. 7 lines 1-55, col. 12 lines 50-68, col. 13 lines 20-45, col. 14 lines 60-65, col. 15 lines 35-60, and col. 16 lines 40-55.

As per claim 12, Nomura [689] teaches the magnetic sensor being disposed within a magnetic fringe field area of the magnetic lens. See Nomura [689] abstract, and figs. 1-3,6-7B.

As per claim 13, Nomura [689] teaches the magnetic sensor being disposed within a cavity in the magnetic lens, and wherein the cavity is disposed between an outer pole piece of the magnetic lens and an inner pole piece of the magnetic lens. See Nomura [689] abstract, figs. 1-3,6-7B, col. 1 lines 30-68, column 4, col. 5 lines 1-

40, col. 7 lines 1-55, col. 12 lines 50-68, col. 13 lines 20-45, col. 14 lines 60-65, col. 15 lines 35-60, and col. 16 lines 40-55.

As per claim 14, Nomura [689] discloses the claimed invention except for specifically stating the magnetic sensor being disposed within an inner pole piece of the magnetic lens. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the magnetic sensor be disposed within an inner pole piece of the magnetic lens, since it has been held that rearranging parts of an invention involves only routine skill in the art.

As per claim 19, Nomura [689] teaches the control means comprising an electronic current drive system configured to receive the control signal during use and to apply the current to the magnetic lens during use. See Nomura [689] abstract, figs. 1-3,6-7B, col. 1 lines 30-68, column 4, col. 5 lines 1-40, col. 7 lines 1-55, col. 12 lines 50-68, col. 13 lines 20-45, col. 14 lines 60-65, col. 15 lines 35-60, and col. 16 lines 40-55.

Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura [689] in view of Gordon [071]. As per claim 15, Nomura [689] teaches all aspects of the claims except for specifically stating the apparatus comprising a temperature sensor coupled to the magnetic lens, wherein the temperature sensor is configured to generate a temperature signal during use, and wherein the temperature signal is responsive to a temperature of the magnetic lens. Gordon [071] does teach a temperature sensor coupled to the magnetic lens, wherein the temperature sensor is configured to generate a temperature signal during use, and wherein the temperature signal is responsive to a temperature of the magnetic lens. See Gordon [071] abstract,

fig. 1, col. 2 lines 44-57, col. 4 lines 45-62, col. 5 lines 60-68, col. 6 lines 1-5, 40-50, col. 7 lines 20-35. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have a temperature sensor coupled to the magnetic lens, wherein the temperature sensor is configured to generate a temperature signal during use, and wherein the temperature signal is responsive to a temperature of the magnetic lens in order aid in stabilizing the temperature of the magnetic lens and thereby stabilize the magnetic field strength due to the inverse dependence of magnetic field strength of the coils with respect to the temperature.

As per claim 16, Gordon [071] teaches the temperature sensor being further coupled to the magnetic sensor, wherein the magnetic sensor is further configured to receive the temperature signal during use and to generate an output signal during use, and wherein the output signal is further responsive to the temperature of the magnetic lens. See Gordon [071] abstract, fig. 1, col. 2 lines 44-57, col. 4 lines 45-62, col. 5 lines 60-68, col. 6 lines 1-5, 40-50, col. 7 lines 20-35.

Claims 1,17,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimoto [364]. As per claim 1, Yoshimoto [364] teaches an apparatus to control a magnetic field strength of a magnetic lens during use, comprising a magnetic sensor (23) disposed within a magnetic field generated by the magnetic field generating means (18,20,21), wherein in the magnetic sensor (23) is configured to generate an output signal during use, and wherein the output signal is responsive to a first magnetic field strength generated by the magnetic field generating means (18,20,21), and a control circuit coupled to the magnetic sensor (23) and the magnetic field generating means

(18,20,21), wherein the control circuit is configured to receive the output signal from the magnetic sensor (23) during use, to receive an input signal responsive to a predetermined magnetic field strength during use, to generate a control signal responsive to the output signal and the input signal during use, and to apply a current to the magnetic lens, wherein the current is responsive to the control signal. See Yoshimoto [364] abstract, figs. 6,9-10, 13, col. 8 lines 65-69, col. 9 lines 40-68, col. 10 lines 10-15, 53-60, column 11, and col. 12 lines 50-66. However, Yoshimoto [364] does not explicitly state that the magnetic field generating means is a magnetic lens. It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the magnetic field generating means of Yoshimoto [364] with a magnetic lens as a matter of design choice since the magnetic field generating means of Yoshimoto [364] and the magnetic lens of applicants invention are used for generating magnetic fields that responsive to changes in current.

As per claim 17, Yoshimoto [364] teaches the control circuit comprises a low-pass circuit element configured to receive the output signal during use and to reduce fluctuations in the output signal during use. See Yoshimoto [364] abstract, figs. 6,9-10, 13, col. 8 lines 65-69, col. 9 lines 40-68, col. 10 lines 10-15, 53-60, column 11, and col. 12 lines 50-66.

As per claim 18, Yoshimoto [364] teaches the control circuit comprises an operational amplifier configured to generate a comparison signal during use, wherein the comparison signal is responsive to a comparison of the output signal and the input signal, and wherein the control signal is further responsive to a function of the

comparison signal. See Yoshimoto [364] abstract, figs. 6,9-10, 13, col. 8 lines 65-69, col. 9 lines 40-68, col. 10 lines 10-15, 53-60, column 11, and col. 12 lines 50-66.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Nos. 4,084,095 to Wolfe, and 5,506,482 to Teramatsu et al. Wolfe [095] is considered pertinent because of electron column comprising a magnetic lens, magnetic sensor, and a feedback system for regulating the magnetic field of the magnetic lens. Teramatsu [482] is considered pertinent because of discussion on a magnetic focusing system with improved symmetry and manufacturability.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (703)-308-6555. The examiner can normally be reached on M-F from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee, can be reached on (703)-308-4116. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

A. Quash 9/27/03

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